4.2.5. TROPICAL TROPOSPHERIC OZONE

Ozone vertical profile measurements obtained during 1995-1999 from ozonesondes flown at Fiji, Samoa, Tahiti, and the Galápagos provide a picture of ozone in the troposphere over the tropical south Pacific Ocean [*Oltmans et al*., 2001]. The seasonal variation at each of these sites is significant. The seasonal behavior at the western Pacific sites is similar, with the Tahiti pattern typical (Figure 4.27). At sites in both the eastern Pacific (i.e., Galápagos; Figure 4.28) and the western Pacific, ozone mixing ratios are greatest at almost all levels in the troposphere during September-November and smallest during March-May. The vertical profile has a relative maximum at all the sites in the troposphere throughout the year; the largest mixing ratios are usually found near the tropopause. This maximum is particularly pronounced during September-November. On average, throughout the troposphere, the Galápagos site has larger ozone mixing ratios than the western Pacific sites. The enhanced ozone in the midtroposphere during September-November is associated with transport from the continents. In the western Pacific this transport is usually from southern Africa (although 10-day back trajectories do not always reach the continent) but also may come from Australia and Indonesia. In the Galápagos the ozone peak in the midtroposphere is associated with transport from the South American continent, and particularly from northern Brazil. High ozone concentrations within potential source regions and transport characteristics associated with the ozone mixing ratio peaks in both the western and eastern Pacific suggest that these enhanced ozone mixing ratios result from biomass burning. In the case of the western Pacific sites, low ozone mixing ratios in the upper troposphere are associated with transport that originates in the convective western Pacific. In the Galápagos the lower ozone mixing ratios in the upper troposphere may be associated both with transport from the upper tropical troposphere in the western Pacific and also with convection in northern South America and Central America.

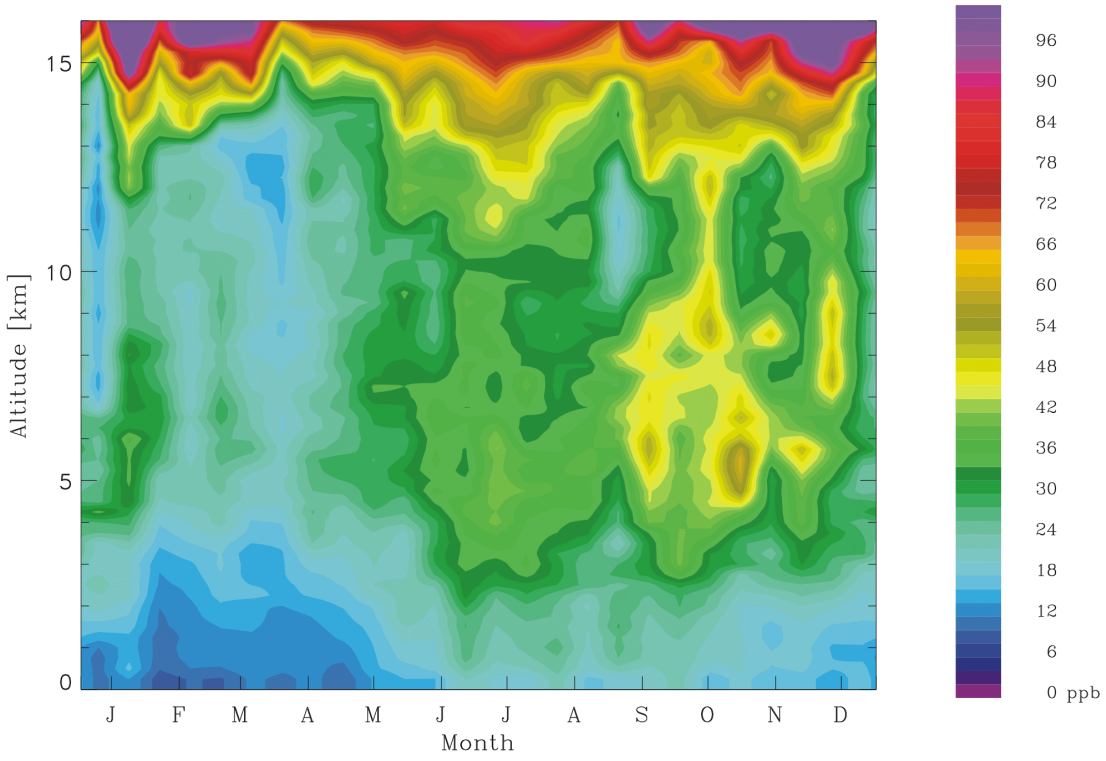

Fig. 4.27. Cross section of average ozone mixing ratios in the troposphere at Tahiti for 1995-1999.

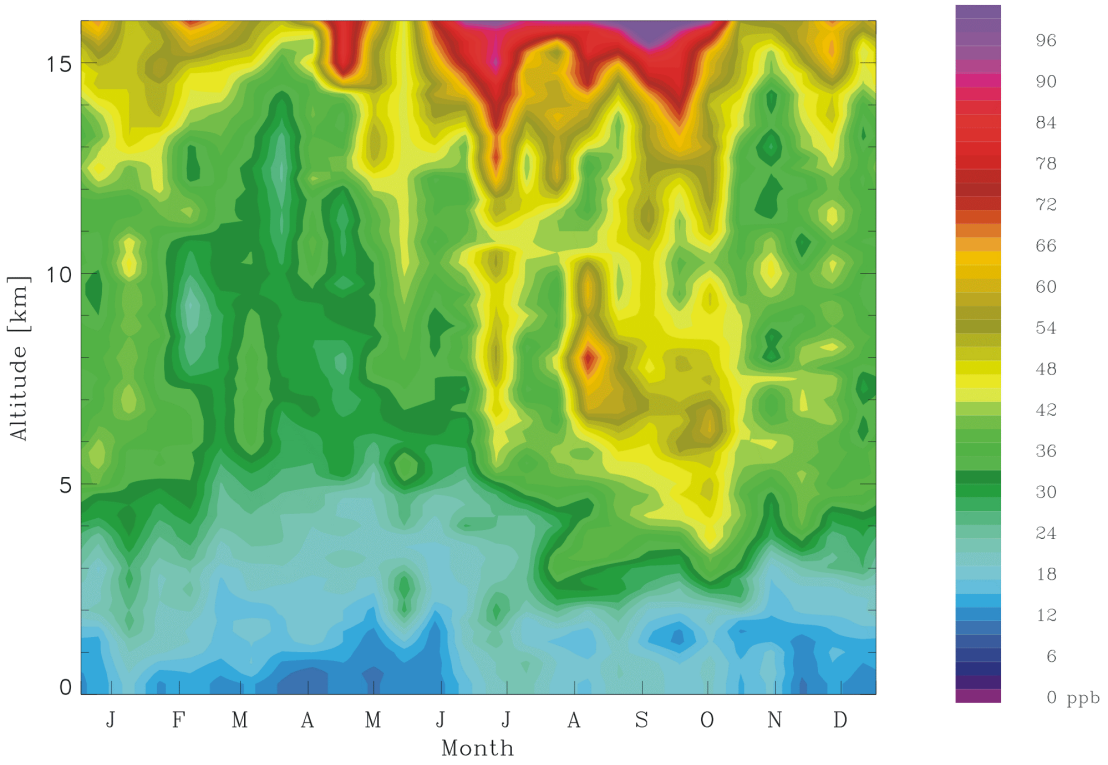

Fig. 4.28. Cross section of average ozone mixing ratios in the troposphere at Galápagos for 1998-1999.